

Parasites of Kalij Pheasants (*Lophura leucomelana*) on the Island of Hawaii¹

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ABSTRACT: Kalij pheasants (*Lophura leucomelana*) were collected from the island of Hawaii from 21 March to 25 June 1981, and were examined for parasites. These introduced forest dwelling pheasants are sympatric with both endangered endemic birds and mosquitoes, which are known vectors of avian malaria. No blood parasites were found in any of the 44 Kalij pheasants examined. An eyeworm, *Oxyspirura* sp., was found in two birds. One pheasant was infested with a body louse *Amyrsidea monostochea*, and a feather louse *Lagopoecus colchicus* was found on two birds. The latter represents a new host record.

KALIJ PHEASANTS (*Lophura leucomelana*) are native to the western foothills of the Himalayas in northern India and Nepal (Bohl 1971). These gallopheasants were introduced into Hawaii in 1962 at the Puu Waawaa Ranch on the island of Hawaii (Lewin 1971) from game farms in Michigan and Texas. They became established and ultimately spread widely through forested regions of the island; they now occur extensively in the tree fern-ohia-koa forests and in exotic forest plantations between 500 and 1600 meters elevation (Lewin and Lewin 1983). Kalij pheasants became so abundant that in 1977 they were declared a legal game species.

The potential impact on native birds through the introduction of disease (especially malaria) carried by exotic species has been recognized (Warner 1968, Berger 1972, van Riper et al. 1982). As almost nothing is known about the parasites of Kalij pheasants, which now live in close proximity to several endangered endemic forest birds, namely, 'Akiapol'au (*Hemignathus wilsoni*), Hawaii creeper (*Loxops maculata*), O'u' (*Psittirostra psittacea*), Hawaiian thrush (*Phaeornis obscurus*), and Hawaiian crow (*Corvus tropicus*) (Pratt, Berrett, and Bruner 1977, Sakai and Ralph 1978, van Riper 1978, van Riper and

Scott 1979, Sakai and Ralph 1980), a survey was conducted to determine if Kalij pheasants act as reservoir hosts for pathogens.

METHODS

Kalij pheasants were shot between 21 March and 25 June 1981. Forty-four pheasants from widely separated areas were collected. Most were from the Kona coast: 36 from the Makaula Ooma Forest Reserve; 5 from the Honaunau Forest Reserve; and 1 from Manuka Forest Reserve. Two were from the Hamakua coast: 1 each from the Humuula and Laupahoehoe Forest Reserves. Fifty percent (22) were collected between 0600 and 0900 h, 27 percent (12) between 1600 and 1900 h, and the remainder (10) during midday.

Immediately following collection, blood was obtained using a heparinized microhematocrit tube. Thin blood smears were made, were fixed in absolute methanol the same day, and later were stained with Giemsa. Each smear was examined at 400× for 10 min to detect blood parasites.

Ectoparasites were found by searching under feather and skin areas of the eye, ear, chin, nape areas and the bases of primary and secondary feathers, and the vent region. Ectoparasites were removed by forceps and preserved in AFA (ethanol-formalin-acetic acid). Forty-one birds were examined for internal parasites. The eye surface under the lids and

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the nasopharynx were searched with a blunt probe. The complete gastrointestinal tract, trachea, lungs, kidneys, liver, and heart were examined using standard techniques (Lewin and Holmes 1971).

RESULTS AND DISCUSSION

Blood Parasites

Recent investigations (Goff and van Riper III 1980, van Riper et al. 1982) have revealed that the mosquito species (*Culex quinquefasciatus*), which serves as a vector for avian malaria (*Plasmodium relictum*), occurs above the previously defined 600 meter line (Warner 1968) to an elevation of 1500 meters, and we collected both *C. quinquefasciatus* and *Aedes albopictus* where Kalij pheasants were observed. Thus, vectors are present well within the altitudinal range of both Kalij pheasants and the endemic avifauna. Examination of blood smears for intracellular and extracellular blood parasites (*Trypanosoma*, *Haemoproteus*, *Plasmodium*, *Lankesterella*, and microfilaria) were negative. Although our sample size was not large and was primarily composed of adults (42 adults, 2 chicks), it appears that the Kalij pheasant may not serve as a reservoir for blood parasites. These negative results should be interpreted cautiously, however, because van Riper and co-workers (1982) found a low prevalence (less than 4 percent) of malarial infection in introduced birds.

Because this forest pheasant which shares its habitat with endemic birds has become so successful and because it is a newly hunted species, plans for its transplantation should be preceded by more extensive examinations for malarial parasites. Collections of Kalij pheasants should be made throughout their distribution, at various times of the year, and should include more young birds.

Helminths

Examination for helminth parasites revealed only two adult female pheasants with nematodes under the eyelids. The infections were light, a single eye worm in one bird and

two in the other. These worms were identified as *Oxyspirura* (*Yorkeispirura*) sp. This genus has previously been reported on Hawaii from California quail (*Lophortyx californica*) and from bare-throated francolin (*Pternistis leucoscepus*) (Lewin and Holmes 1971).

Ectoparasites

Infestations of lice were found on three adult females. Lice were located at feather bases primarily in the head and neck regions. These parasites were found only on birds collected in June, and all had light infestations (12 or fewer per bird).

The lice were identified as *Amyrsidea monostoecha* (Kellogg, 1896) and *Lagopoecus colchicus* Emerson, 1949. Emerson (unpublished records) has found *A. monostoecha* on wild Kalij pheasants in Thailand. The Thailand record suggests that this body louse was not acquired in Hawaii or at the original game-farm origin in Michigan or Texas. *L. colchicus* was found on two birds. This feather louse is known to infest ring-necked pheasants (*Phasianus colchicus*) from Illinois, Montana, and Utah (Emerson, unpublished records). Since ring-necked pheasants are allopatric to Kalij in Hawaii, they may have acquired this louse locally. Our finding of *L. colchicus* constitutes a new host and apparently a new locality record.

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